Surgitron F.F.P.F.™

QUALITY RECORD
&
MAINTENANCE MANUAL

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Congratulations upon your purchase of ellman **international, inc's** radiosurgical instrument, **Surgitron F.F.P.F.**™

Since 1969, ellman has been manufacturing and selling radiosurgical instruments of the highest quality. We have been the leaders in the field. Our innovation, 23 United States patents, and commitment to our proven record of safety and superior performance is documented in numerous clinical articles and textbooks in the specialties of OB/GYN, family practice, plastic surgery, otolaryngology, ophthalmology, and general surgery.

Since 1976, **Surgitron** has been approved continually by Underwriters Laboratories and the Canadian Standards Association as well as by electrical registrar's in several European and Asian countries.

Be assured that you are testing the safest, most reliable high-frequency radiosurgical instrument available. The following technical and safety information is provided to assist you, the bio-medical engineer, in a thorough, trouble-free performance verification and safety inspection of **Surgitron**.

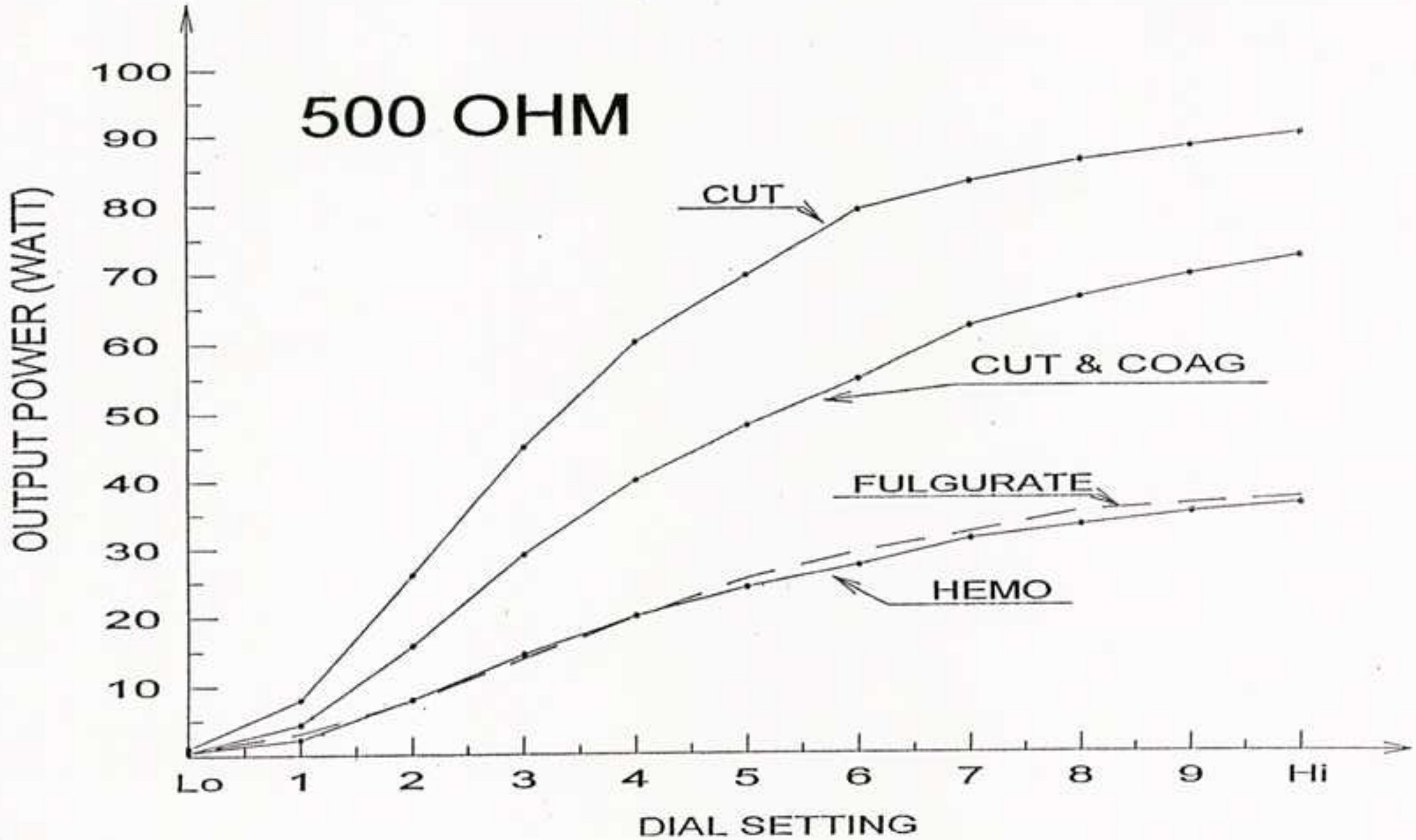
If you require additional information or have any questions or comments regarding this equipment, feel free to contact ellman **international, inc.** for a speedy reply.

For technical support, call our Repair Service Department at
1-800-835-5355 x 19 or 516-569-1482 x 19.

For clinical support, call our Radiosurgical Specialists at
1-800-835-5355 x 8 or 516-569-1482 x 8.

UL approved, Medical and Dental Equipment, Professional, E54276 (M)
FDA 510K registered, K914329/A
CSA certified for Electromedical Equipment, 40114

SURGITRON FFPF OUTPUT POWER CHARACTERISTIC



NOTE:

1. The data is obtained by using a 500 Ohm resistive load.
2. Measurement Equipment:
   a. HITACHI Oscilloscope v-1060 100MHz
   b. MRS 500 Ohm Non-Ind Resistor
   c. Dynatech 454A
3. Output reference power 140W peak is recorded on the label.

DIMENSION = N/A	ellman international, inc. hewlett, ny 11557
TOLERANCES: +/- 20% DECIMAL.= N/A FRACTIONAL: = N/A ANGULAR= N/A	TITLE: SURGITRON OUTPUT POWER — REV: A
MATERIAL: SURGITRON FFPF	DRAWN BY: FRANK LIN — SCALE: 1:1
DRAWING NUMBER: FFPF-0500-1	APPROVED BY: — DATE: 5/22/'95 — SHEET: 1/2

MAINTENANCE AND TROUBLESHOOTING

The system block diagram and basic circuit are provided here, Fig. 1. and 2., for general review of the basic circuits that make up the Surgitron™

They should be reviewed carefully before performing any troubleshooting. The power supply includes the thermal transformer, fuses and line switch. Four high power diodes make up the full wave rectifier. Mode selector controls the output waveform from rectifier and filter. There are three options from mode selector:

1. Full-rectified and filtered
2. Fully-rectified
3. Partially-rectified

They are used to perform cut, cut and coag, and hemo, respectively.

RF signal network generates high-frequency signal, 3.8 MHz sinusoidal waveform as a carrier frequency, which is modulated by the lower frequency signal from mode selector.

The output power controller controls the output impedance matching, so thus, the power output. Power output vs. load impedance test curves are included for your reference, see Fig. 3. This power intensity curve is plotted with 500 Ohm pure resistance load.

Indifferent plate provides the return path to R.F. signal. The system operation at output is controlled by the foot-switch, which consists of a foot-pedal and an electrical switch.

The following fault conditions are defined along with the check procedure and the specific conditions experienced. Step-by -step procedures necessary to isolate the fault are provided, so thus solutions are achieved.

A. If red AC Light does not light up:

1. check that power cord is plugged into wall outlet and other end is correctly plugged into receptacle unit.
2. Check fuses: do not use larger than indicated, 3.0 amp/117 v or 1.6 amp/220-240 v. Using larger fuse will damage the Surgitron Unit. Replace fuse with P/N: REK3 FUSE.
3. Fuse continues to blow: remove four screws from both sides of the unit, and carefully remove cove, check for the following conditions:
    a. Transformer short circuit: replace P/N:REK10 Thermo Transformer.
    b. Check short circuit on the vector board: replace P/N: REK12 Vector Board.
4. Check AC indicator bulb: if it is open-circuit, replace P/N:REK5 Light Bulb.
5. Check secondary output voltage from transformer:
    a. Between green wires should be >6.3 v.
    b. Between red wires should be >600 v.
    If the condition does not meet then replace P/N:REK10 Thermo Transformer.

6. Visually inspect the unit for shorted or burnt resistors and capacitors. inspect wire connections and solder joints.
7. Tube may be defective, replace P/N:REK11 Tube.

B. If RF indicator does not light when foot-switch is pressed:

1. Allow 15 second warm-up period before activating the unit.
2. Defective foot-switch , replace with P/N:REK2 Foot Control.
3. Turn on the unit and allow 15 second warm-up period. visually inspect tube filament, if it does not glow, (and AC indicator light is on) then replace with P/N:REK11 Tube.
4. Check RF light bulb, if it is open-circuit then replace it with P/N:REK5 Light bulb.
5. Check Vector board:
    a. If green/yellow ground wire is connected. This wire must attach to chassis ground.
    b. Check shorted or burnt components, if there is, replace with P/N:REK12 Vector Board.

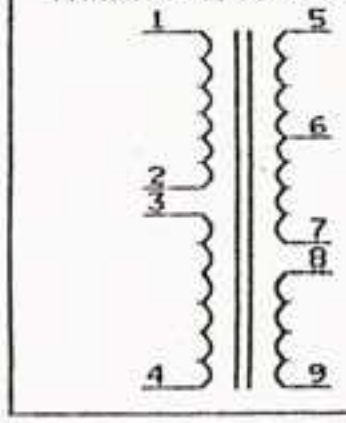
C. If Voltage is too high across C1/C2 to ground

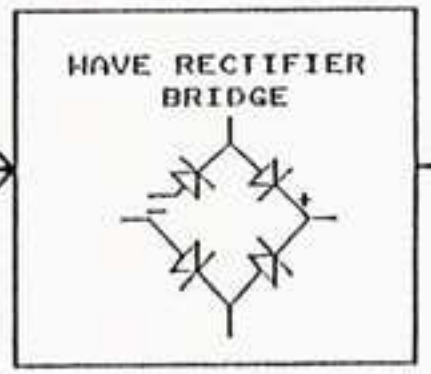
1. Voltage across C1/C2: 500 VDC to ground in CUT Mode.

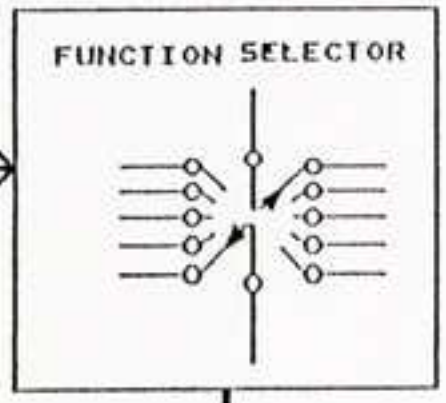
2. Check the transformer wiring
   220 VAC - the Black and the White transformer primary wires should be used.
   110 VAC - the Black and the Black/Red transformer primary wires should be used.
   100 VAC - the Black and the Black/white transformer primary wires should be used.

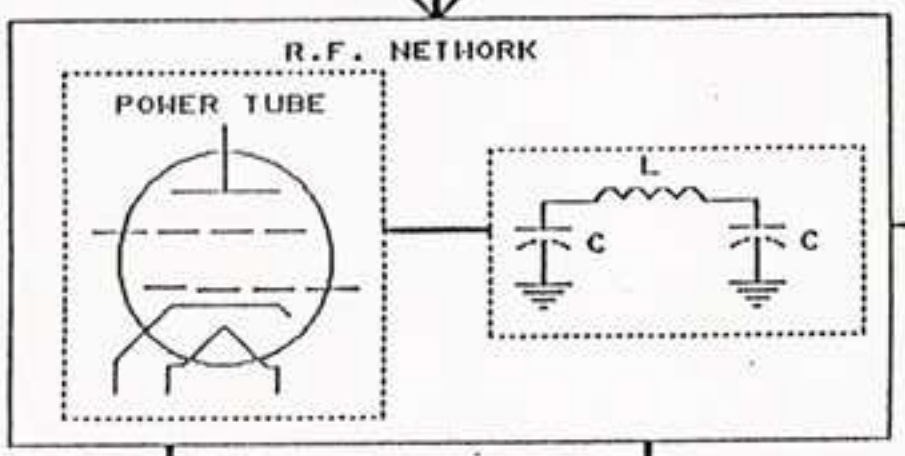
3. Check that Capacitor C14 is soldered to Ground lug located below L3.

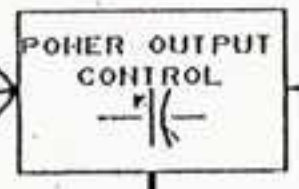
POWER SUPPLY
THERMO-TRANSFORMER





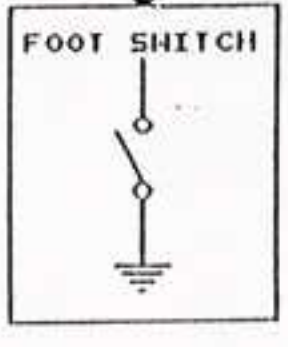


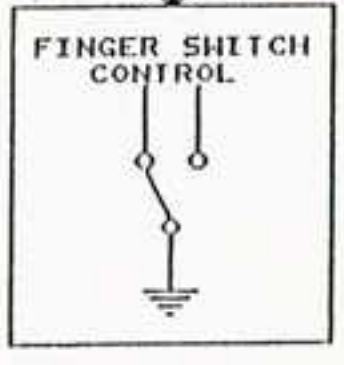




ACTIVE OUTPUT

HANDPIECE FULGURATE





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Title
SURGITRON SYSTEM BLOCK DIAGRAM

Size	Document Number	REV
A	09111991	B

Date: November 4, 1991 Sheet 1 of 1

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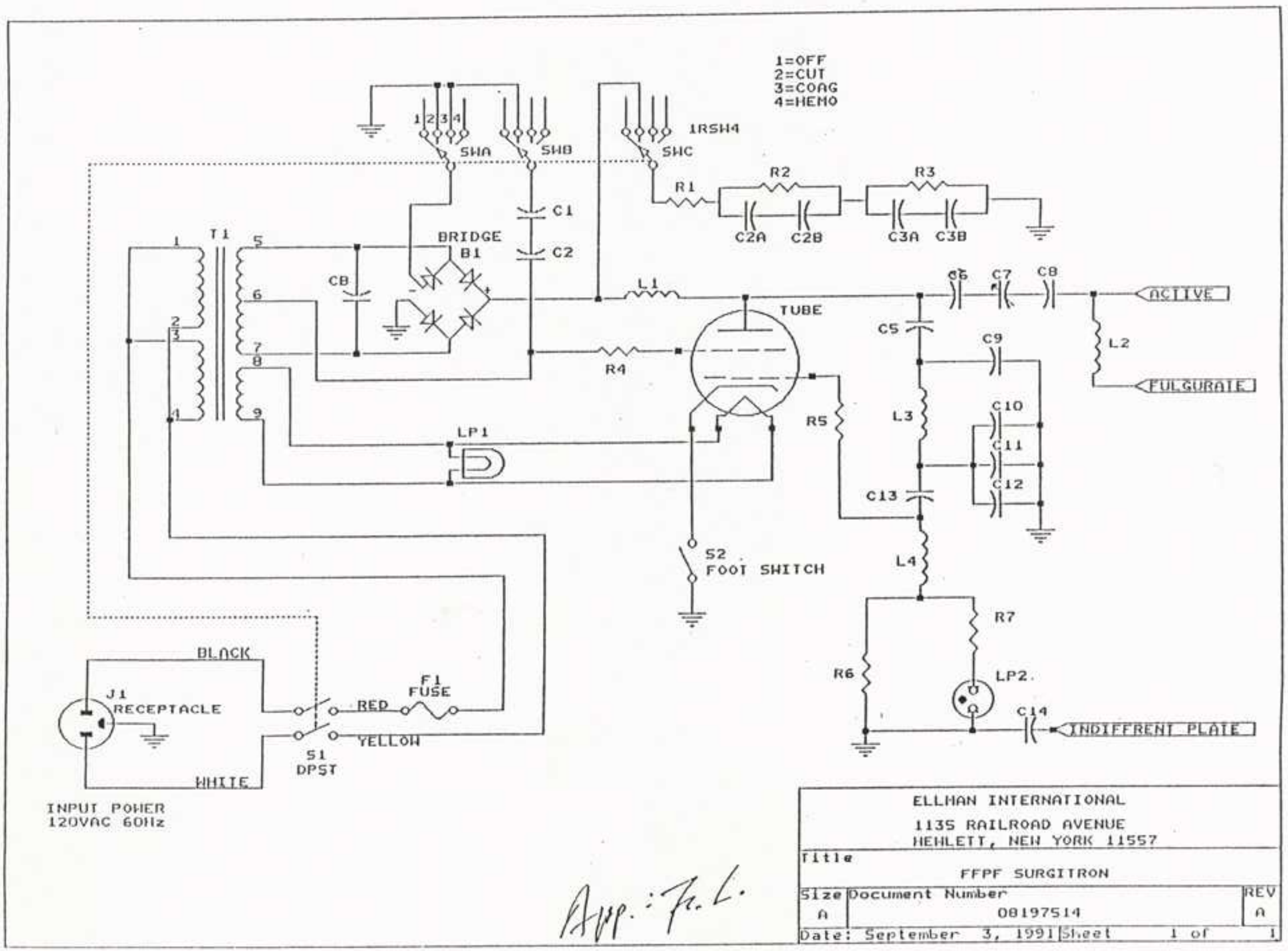

App: J.L.

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Title		
FFPF SURGITRON		
Size A	Document Number 08197514	REV A
Date: September 3, 1991	Sheet 1 of 1	

REPAIR KIT DESCRIPTION

BLACK KNOB:
- a. Function selector knob.
- b. Power control knob.

FOOT CONTROL:
- a. Cable.
- b. Foot control paddle.
- c. Foot switch.

FUSE:
- a. 1.6 amp/220 v.
- b. 3.0 amp/117 v.

JACK:
- a. Green Jack.
- b. Black Jack.
- c. Red Jack.

LIGHT BULB:
- a. AC light bulb.
- b. RF light bulb.

LIGHT CAP:
- a. Red light cap.
- b. White light cap.

OUTPUT POWER CONTROL:
- a. Vari capacitor.

POWER FILTER:
- a. R1, R2, and R3.
- b. C2a, C2b, C3a, and C3b.

RES. COIL:
- a. L3.

THERMO TRANSFORMER:
- a. Universal input thermo power transformer.

TUBE:
- a. Electronic power tube.

VECTOR BOARD:
- a. CB
- b. C5, C6, and C13.
- c. C9, C10, C11, and C12.
- d. D1, D2, D3, and D4.
- e. L1, and L4
- f. R5.

Surgitron FFPF

BLUE UNIT

CB	Capacitor	18.85
C1,C2	Capacitors	19.90 ea
C2A, C2B	Capacitors	19.90 ea
C3A, C3B	Capacitors	19.90 ea
C5	Capacitor	19.90
C6	Capacitor	19.90
C7	Vari Capacitor	96.55
C8	Capacitor	22.95
C9	Capacitor	22.95
C10	Capacitor	22.95
C11	Capacitor	22.95
C12	Capacitor	22.95
C13	Capacitor	22.95
C14	Capacitor	22.95
C15	Green Indiff. Plate Jack	21.95
C16	Black Active Jack	21.95
C17	White Fulgurate Jack	21.95
C18	Green Plug	22.95
C19	Black Plug	22.95
C20	Blue Jack	21.95
D1	Diode	18.85
D2	Diode	18.85
D3	Diode	18.85
D4	Diode	18.85
F1	1.6 Amp Fuse (220V)	18.85
F2	3 Amp Fuse (110V)	18.85
F3	Fuse Holder	21.95
L1	Choke	37.75
L2	Coil	54.95
L3	Air Coil	64.55
L4	Choke	37.75
PL1	AC LED	23.95
PL2	RF LED	23.95
PL3	AC Red Cap	18.85
PL4	RF White Cap	18.85
R1	Resistor	25.15
R2	Resistor	25.15
R3	Resistor	25.15
R4	Resistor	25.15
R5	Resistor	25.15
R6	Resistor	25.15
R7	Resistor	18.85
S1	Wave Form Switch	113.95
S2	Foot Control	113.95
S3	Blk. Waveform Knob	23.95
T1	Thermo Transformer	222.95
V1	Tube Socket	25.15
V2	Tube [redacted]	101.95
V3	Terminal Strip	29.35
V4	Black Power Dial	25.15
Z1	Surgitron Base	125.95
Z2	Plug	31.45
Z3	Coil Cord	23.95
Z6	U.L. Wiring	23.95
Z7	Surgitron Cover	125.95

#101.95

H4	Coated Antenna	
XHP1	Handpieces (2)	

#25295